

AMENDMENT

In the Claims:

Please amend claims 1-7, 13-15, 41-43, 45-51, 66, 68, 102 and 103, so that the text of the amended claims read as follows:

1. (Twice Amended) A composition comprising at least a first nucleic acid segment in association with a structural matrix, wherein:
 - (a) at least a portion of said structural matrix is comprised of a porous, synthetic polymer that contains pores formed by gas foaming and pores formed by leaching out of a particulate from the polymer; or
 - (b) at least a portion of said structural matrix is a porous, modified alginate matrix that comprises at least one alginate chain section bonded to at least one molecule that mediates cellular interactions.
2. (Amended) The composition of claim 1, wherein at least a portion of said structural matrix is comprised of a porous, synthetic polymer that contains pores formed by gas foaming and pores formed by leaching out of a particulate from the polymer.
3. (Amended) The composition of claim 2, wherein at least a portion of said structural matrix is comprised of a porous, synthetic polymer that has an open pore structure.
4. (Amended) The composition of claim 3, wherein at least a portion of said structural matrix is comprised of a porous, synthetic polymer that has an interconnected pore structure.

5. (Amended) The composition of claim 2, wherein said structural matrix consists essentially of a porous, synthetic polymer that has an open pore structure.

6. (Amended) The composition of claim 2, wherein said structural matrix comprises at least a first matrix portion comprised of said porous, synthetic polymer integrally connected to at least a second matrix portion comprised of an impermeable polymer.

7. (Amended) The composition of claim 6, wherein said at least a first matrix portion is comprised of a porous, synthetic polymeric material that has a substantially uniform open pore structure, and wherein said at least a second matrix portion is comprised of the same synthetic polymeric material in a form that lacks an open pore structure.

13. (Twice Amended) The composition of claim 1, wherein at least a portion of said structural matrix is a porous, modified alginate matrix that comprises at least one alginate chain section bonded to at least one molecule that mediates cellular interactions.

14. (Amended) The composition of claim 13, wherein at least a portion of said structural matrix is a modified alginate matrix that comprises at least one alginate chain section bonded to at least one molecule that mediates cellular interactions utilizing one or more uronic acid residues on said alginate chain section.

15. (Amended) The composition of claim 13, wherein at least a portion of said structural matrix is a modified alginate matrix that comprises at least one alginate chain section bonded to

at least one cellular interaction molecule selected from the group consisting of cell adhesion molecules, cell attachment peptides, proteoglycan attachment peptide sequences, proteoglycans, cell adhesion polysaccharides, growth factors and cell adhesion enzymes.

41. (Amended) The composition of claim 2, prepared by a process that comprises leaching out the particulate material from a composition comprising a gas foamed, synthetic polymeric material, at least a first nucleic acid segment and a leachable particulate material.

42. (Amended) The composition of claim 2, prepared by a process that comprises the steps of:

- (a) preparing an admixture comprising at least a first nucleic acid segment, particles capable of forming a synthetic polymeric structure and a leachable particulate material;
- (b) subjecting said admixture to a gas foaming process to create a porous, synthetic polymeric structure that comprises said at least a first nucleic acid segment and said leachable particulate material; and
- (c) subjecting said porous, synthetic polymeric structure to a leaching process that removes said leachable particulate material from said porous, synthetic polymeric structure, thereby producing a synthetic polymeric structure of additional porosity that comprises said at least a first nucleic acid segment.

43. (Amended) The composition of claim 42, wherein said admixture comprises said at least a first nucleic acid segment, beads or microspheres capable of forming a synthetic polymeric structure and said leachable particulate material.

45. (Amended) The composition of claim 42, wherein said leaching process is conducted *in vitro* by subjecting said porous, synthetic polymeric material to a leaching agent.

46. (Amended) The composition of claim 42, wherein said leaching process is conducted *in vivo* by exposing said porous, synthetic polymeric material to body fluids.

47. (Amended) A composition comprising at least a first nucleic acid segment in non-covalent association with a structural matrix, wherein at least a portion of said structural matrix is comprised of a porous, synthetic polymer that contains pores formed by gas foaming and pores formed by leaching out of a particulate from the polymer.

48. (Twice Amended) A composition comprising at least a first nucleic acid segment in non-covalent association with a structural, porous modified alginate matrix that comprises at least one alginate chain section bonded to at least one molecule that mediates cellular interactions.

49. (Amended) A composition comprising at least a first nucleic acid segment in association with a structural matrix, said structural matrix comprising at least a first matrix portion comprised of a porous, synthetic polymer that contains pores formed by gas foaming and pores

formed by leaching out of a particulate from the polymer, wherein said first matrix portion is integrally connected to a second matrix portion comprised of an impermeable polymer.

50. (Amended) The composition of claim 49, wherein said first and second matrix portions are comprised of the same synthetic polymeric material, separately fabricated to form a first, porous, synthetic polymer having a uniform open pore structure and a second, impermeable synthetic polymer lacking an open pore structure.

51. (Amended) The composition of claim 49, wherein said first and second matrix portions are comprised of different synthetic polymeric materials.

66. (Twice Amended) A kit comprising, in at least a first suitable container, at least a first nucleic acid segment and a structural matrix, wherein at least a portion of said structural matrix is a structural, porous modified alginate matrix that comprises at least one alginate chain section bonded to at least one molecule that mediates cellular interactions or a structural matrix comprised of a porous, synthetic polymer that contains pores formed by gas foaming and pores formed by leaching out of a particulate from the polymer.

68. (Twice Amended) An implantable device comprising at least a first nucleic acid segment in association with a structural matrix, wherein at least a portion of said structural matrix is a structural, porous modified alginate matrix that comprises at least one alginate chain section bonded to at least one molecule that mediates cellular interactions or a structural matrix

comprised of a porous, synthetic polymer that contains pores formed by gas foaming and pores formed by leaching out of a particulate from the polymer.

102. (Amended) The kit of claim 66, wherein at least a portion of said structural matrix is comprised of a porous, synthetic polymer that contains pores formed by gas foaming and pores formed by leaching out of a particulate from the polymer.

103. (Amended) The implantable device of claim 68, wherein at least a portion of said structural matrix is comprised of a porous, synthetic polymer that contains pores formed by gas foaming and pores formed by leaching out of a particulate from the polymer.

Please add new claims 104-117, as follows:

104. (New) A composition comprising at least a first nucleic acid segment in association with a structural matrix, wherein:

- (a) at least a portion of said structural matrix is comprised of a porous polymer that contains pores formed by gas foaming and pores formed by leaching out of a particulate from the polymer; or
- (b) at least a portion of said structural matrix is a porous alginate or modified alginate matrix;

and wherein said nucleic acid segment encodes a protein or polypeptide that stimulates a bone progenitor cell, wound healing fibroblast, granulation tissue fibroblast or repair cell when expressed in said cell, or that stimulates an immune response when expressed by an antigen presenting cell, or that induces cell death upon expression in a cell.

105. (New) A composition comprising at least a first nucleic acid segment in association with a structural matrix, wherein:

- (a) at least a portion of said structural matrix is comprised of a porous polymer that contains pores formed by gas foaming and pores formed by leaching out of a particulate from the polymer; or
- (b) at least a portion of said structural matrix is a porous alginate or modified alginate matrix;

and wherein said nucleic acid segment encodes a transcription or elongation factor, cell cycle control protein, kinase, phosphatase, DNA repair protein, oncogene, tumor suppressor, angiogenic protein, anti-angiogenic protein, immune response stimulating protein, cell surface receptor, accessory signaling molecule, transport protein, enzyme, anti-bacterial protein or polypeptide, anti-viral protein or polypeptide, hormone, neurotransmitter, growth factor, growth factor receptor, interferon, interleukin, chemokine, cytokine, colony stimulating factor or chemotactic factor protein or polypeptide.

106. (New) The composition of claim 105, wherein said nucleic acid segment encodes a growth hormone (GH) protein or polypeptide, a parathyroid hormone (PTH) protein or polypeptide, a PTH1-34 polypeptide or a bone morphogenetic protein (BMP) protein or polypeptide.

107. (New) The composition of claim 106, wherein said nucleic acid segment encodes a BMP-2A, BMP-2B, BMP-3, BMP-4, BMP-5, BMP-6, BMP-7 or BMP-8 protein or polypeptide.

108. (New) The composition of claim 105, wherein said nucleic acid segment encodes a transforming growth factor- α (TGF- α), TGF- β 1 or TGF- β 2 protein or polypeptide, a latent TGF β binding protein (LTBP) protein or polypeptide, an activin/inhibin protein or polypeptide, a fibroblast growth factor (FGF), a granulocyte/macrophage colony stimulating factor (GMCSF), an epidermal growth factor (EGF), a platelet derived growth factor (PDGF), an insulin-like growth factor (IGF) or a leukemia inhibitory factor (LIF).

109. (New) A composition comprising at least a first nucleic acid segment in association with a structural matrix, wherein:

- (a) at least a portion of said structural matrix is comprised of a porous polymer that contains pores formed by gas foaming and pores formed by leaching out of a particulate from the polymer; or
- (b) at least a portion of said structural matrix is a porous alginate or modified alginate matrix;

and wherein said composition further comprising a population of cells.

110. (New) The composition of claim 109, wherein at least a portion of said nucleic acid segment is taken up by the cells comprised within said composition.

111. (New) A composition comprising at least a first nucleic acid segment in association with a structural matrix, wherein at least a portion of said structural matrix is comprised of a porous polymer that contains pores formed by gas foaming and pores formed by leaching out of a

particulate from the polymer; and wherein the polymer in said portion of said structural matrix is a lactic acid polymer, glycolic acid polymer or lactic acid/glycolic acid copolymer.

112. (New) The composition of claim 111, wherein at least a portion of said structural matrix is comprised of a lactic acid/glycolic acid (PLGA) copolymer matrix.

113. (New) A structural matrix-nucleic acid composition comprising at least a first nucleic acid segment in association with a structural matrix that has an interconnected or open pore structure, wherein:

- (a) at least a portion of said structural matrix is comprised of a porous polymer that contains pores formed by gas foaming and pores formed by leaching out of a particulate from the polymer; or
- (b) at least a portion of said structural matrix is a porous alginate or modified alginate matrix;

and wherein said structural matrix-nucleic acid composition promotes proliferation, migration, ingrowth or infiltration of cells into said structural matrix and wherein said cells take up and express said nucleic acid segment.

114. (New) The composition of claim 2, wherein at least a portion of said structural matrix is comprised of a polyester, polyanhydride, polyphosphazine, poly(vinyl alcohol), poly(alkylene oxide), poly(allylamine), poly(acrylate), modified polystyrene or polyolefin polymer or copolymer.

115. (New) The composition of claim 114, wherein at least a portion of said structural matrix is comprised of a polyhydroxybutyrate, poly- ϵ -caprolactone, poly(ethylene oxides), poly(4-aminomethylstyrene), poly(vinylpyrrolidone), polyethylene, polypropylene or polyethylene terephthalate polymer or copolymer.

116. (New) A structural matrix-nucleic acid composition comprising at least a first nucleic acid segment in association with a structural matrix that has an interconnected or open pore structure, wherein:

- (a) at least a portion of said structural matrix is comprised of a porous, synthetic polymer that contains pores formed by gas foaming and pores formed by leaching out of a particulate from the polymer; wherein said synthetic polymer is a lactic acid, glycolic acid, lactic acid/glycolic acid, polyester, polyanhydride, polyphosphazine, poly(vinyl alcohol), poly(alkylene oxide), poly(allylamine), poly(acrylate), modified polystyrene or polyolefin polymer or copolymer; or
- (b) at least a portion of said structural matrix is a porous, modified alginate matrix that comprises at least one alginate chain section bonded to at least one molecule that mediates cellular interactions;

and wherein said structural matrix-nucleic acid composition promotes proliferation, migration, ingrowth or infiltration of cells into said structural matrix and wherein said cells take up and express said nucleic acid segment.

117. (New) The composition of claim 116, wherein said synthetic polymer is a lactic acid/glycolic acid (PLGA) copolymer matrix.